

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE  
General Certificate of Secondary Education



CYD-BWYLLGOR ADDYSG CYMRU  
Tystysgrif Gyffredinol Addysg Uwchradd

184/06

**MATHEMATICS**

**INTERMEDIATE TIER PAPER 2**

A.M. MONDAY, 12 June 2006

(2 Hours)

**ADDITIONAL MATERIALS**

A calculator will be required for this paper.

**INSTRUCTIONS TO CANDIDATES**

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take  $\pi$  as 3.14 or use the  $\pi$  button on your calculator.

**INFORMATION FOR CANDIDATES**

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

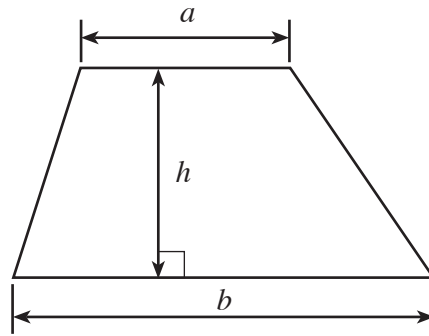
The number of marks is given in brackets at the end of each question or part-question.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

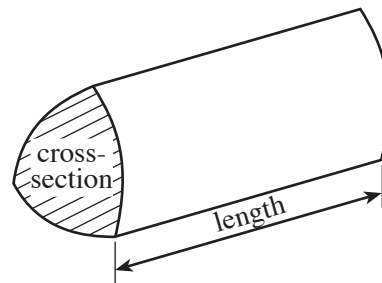
For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	6	
2	4	
3	3	
4	3	
5	4	
6	6	
7	8	
8	5	
9	3	
10	4	
11	6	
12	2	
13	3	
14	4	
15	7	
16	3	
17	4	
18	3	
19	4	
20	4	
21	6	
22	4	
23	4	
<b>TOTAL MARK</b>		

**Formula List**

**Area of trapezium** =  $\frac{1}{2} (a + b)h$



**Volume of prism** = area of cross-section  $\times$  length



1. (a) Megan hires a van for a number of days.  
The hire charges are:  
£54.60 for the first day,  
£37.40 for each additional day.  
Her total bill was £204.20.  
For how many days did she hire the van?

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- (b) Calculate 84% of 67, giving your answer correct to 3 significant figures.

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[3]

2. (a) Alonso changed 1200€ (euros) into pounds (£), when the rate of exchange was 1€ = £0.68.  
How many pounds did he get?

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[2]

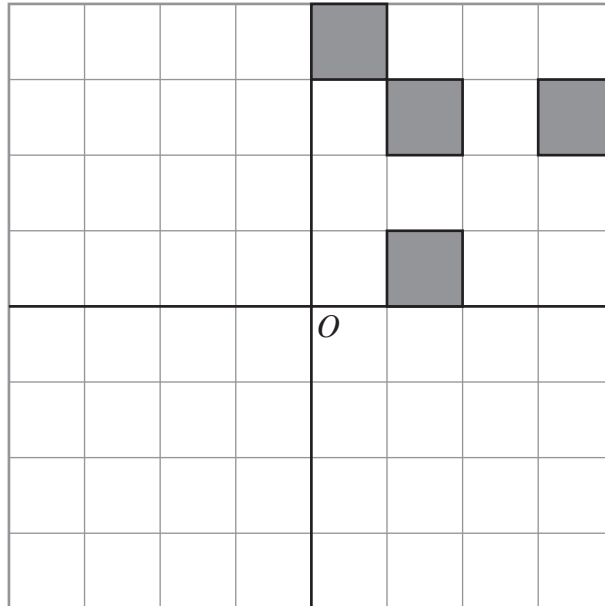
- (b) During his stay Alonso spent £374 on his accommodation. At the same exchange rate, how many euros is this?

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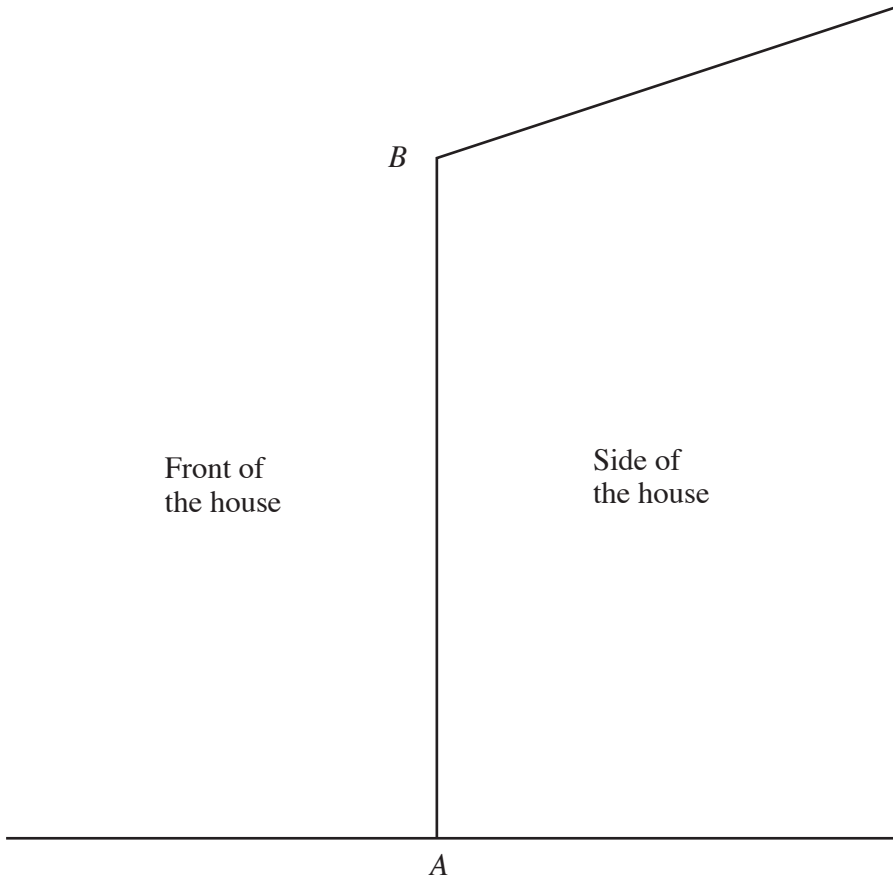
[2]

3. Draw patterns, like the one given, in each of the other 3 sections so that the completed pattern has rotational symmetry of order 4 about  $O$ .

[3]



4.



The diagram is a scale drawing of the side view of a house using a scale of 1:80.  
Measure  $AB$  and calculate the actual height of the front of the house in metres.

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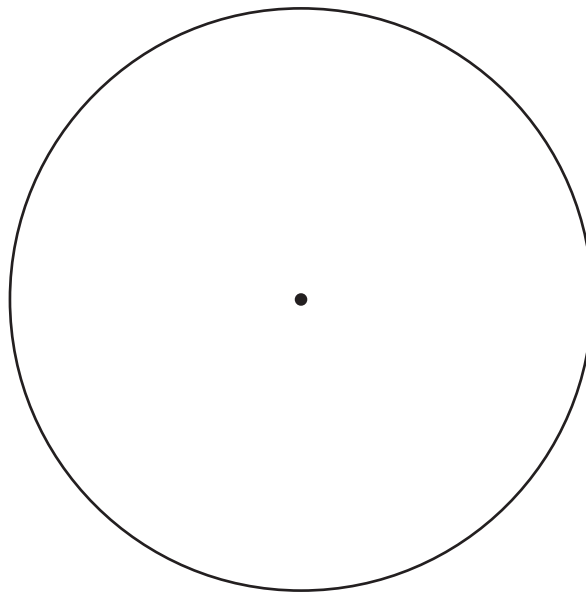
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[3]

5. The type of mobile phone owned by each of 60 pupils was recorded. The results are summarised in the table below.

Type of mobile phone	Number of pupils
A	25
B	16
C	10
Other	9

Draw a pie chart to illustrate these results. You should show how you calculate the angles of your pie chart.



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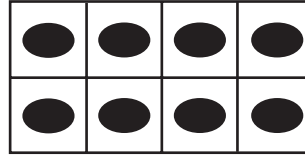
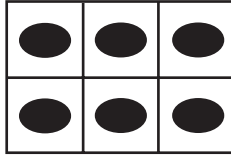
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6. A shopkeeper sells bars of chocolate in two different sizes. The small bar has 6 pieces of chocolate and the large bar has 8 pieces of chocolate, as illustrated in the following diagrams.



The shopkeeper has  $x$  small bars of chocolate.

- (a) Write down, in terms of  $x$ , the total number of pieces of chocolate in these  $x$  bars.

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[1]

- (b) The number of large bars the shopkeeper has is 11 less than the number of small bars. Write down, in terms of  $x$ , the number of large bars he has.

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[1]

- (c) Write down, in terms of  $x$ , the total number of pieces of chocolate in these large bars.

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[1]

- (d) Write down, in terms of  $x$ , the total number of pieces of chocolate in all the bars. You must simplify your answer as far as possible.

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7. (a) In an examination Terry's mark was 140 out of a possible total of 250. Express Terry's mark as a percentage of the total.

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[2]

- (b) A suit costs £180 to make and is sold at a profit of 35%. What is the selling price?

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[3]

- (c) Find the value of **each** of the following, giving your answers correct to 4 decimal places.

(i)  $(0.841)^6$

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(ii)  $\frac{5.9 \times 0.126}{94.3 + 83.8}$

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[3]



8. In both parts (a) and (b) of this question you should give your answer to an appropriate degree of accuracy.

A circular table mat has a radius of 9 cm.

- (a) Calculate the area of one surface of the table mat.

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- (b) Calculate the perimeter of the table mat.

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9. Solve the equation

$$4(x - 3) = 20 .$$

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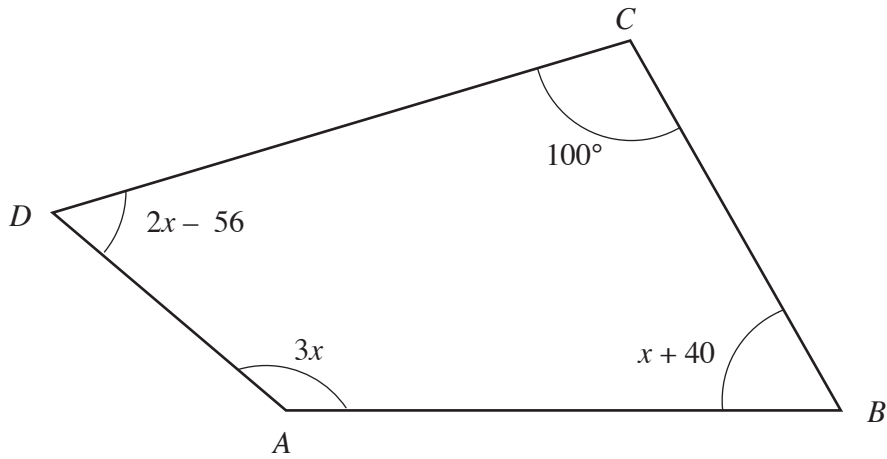
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[3]

10. In the diagram below,  $ABCD$  is a quadrilateral with angles having the values, in degrees, as shown in the diagram.



*Diagram not drawn to scale.*

- (a) Write down an equation that  $x$  satisfies.

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[2]

- (b) Solve the equation to find the value of  $x$ .

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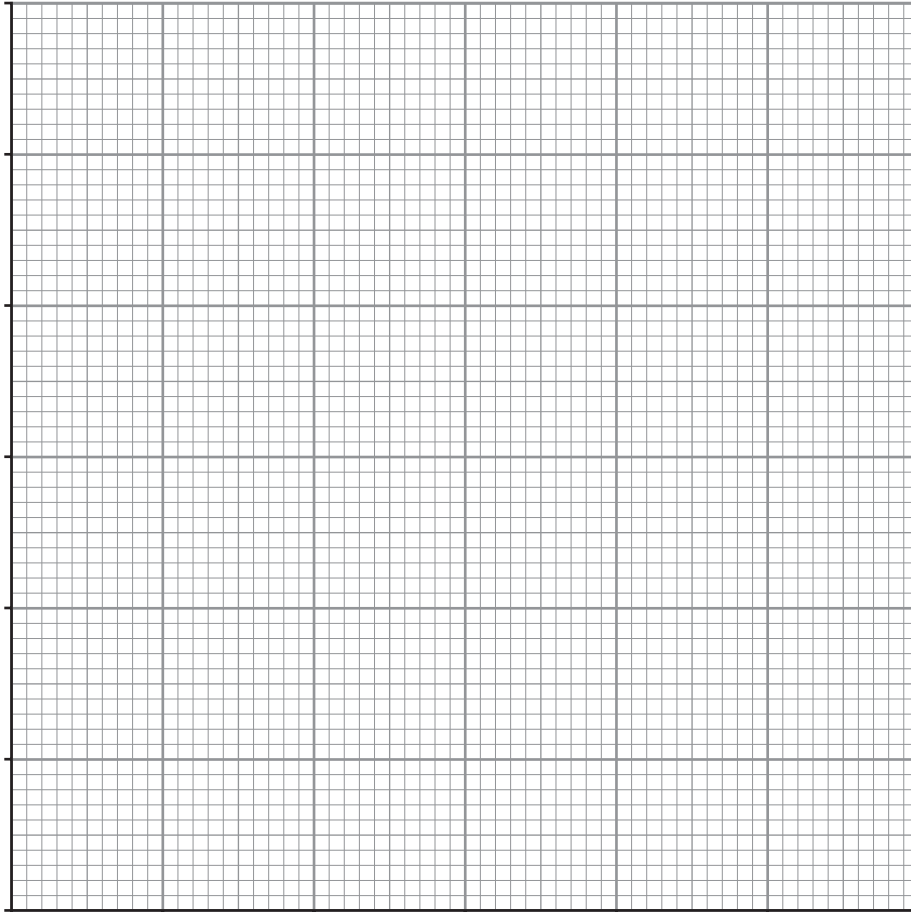
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11. The waist measurements of 80 people were measured. The table shows a grouped frequency distribution of the results.

Waist ( $x$ cm)	Class Mid-point	Number of people
$60 < x \leq 65$	62.5	10
$65 < x \leq 70$	67.5	12
$70 < x \leq 75$	72.5	22
$75 < x \leq 80$	77.5	25
$80 < x \leq 85$	82.5	7
$85 < x \leq 90$	87.5	4

- (a) On the graph paper below, draw a grouped frequency diagram for the data.

[3]



(b) Find an estimate for the mean waist measurement of the people.

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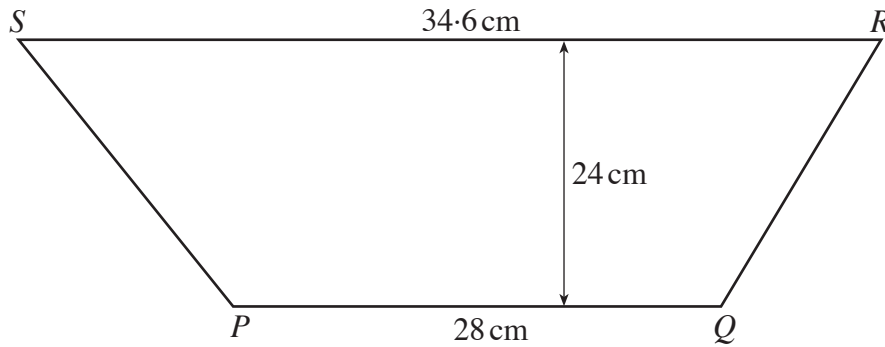
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12. A trapezium  $PQRS$  is such that  $PQ$  is parallel to  $SR$ ,  $PQ = 28$  cm,  $SR = 34.6$  cm and the perpendicular distance between the parallel sides is 24 cm. Calculate the area of the trapezium.



*Diagram not drawn to scale.*

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13. Volunteers decide to give to three charities in the ratio 3:4:8. If the volunteers raise a total of £6000, how much will each charity receive?

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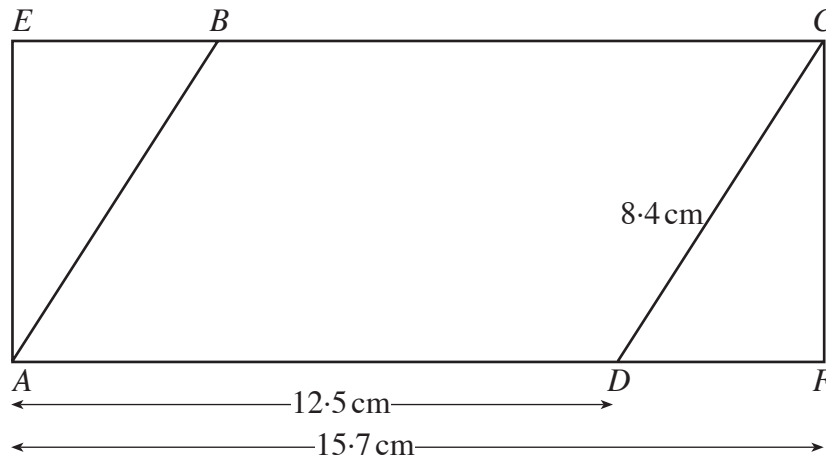
[3]

14. Mr. and Mrs. Evans estimate that during any year their furniture depreciates in value by 24% of its value at the beginning of that year. Initially the value of their furniture was £5000. Find the value of their furniture at the end of 3 years of depreciation. Give your answer to the nearest £100.

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[4]

15.



*Diagram not drawn to scale.*

$ABCD$  is a parallelogram in which  $AD = 12.5$  cm and  $DC = 8.4$  cm.  $AECF$  is a rectangle in which  $AF = 15.7$  cm.

(a) Find the length of the side  $CF$  of the rectangle.

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(b) Calculate the area of the parallelogram  $ABCD$ , stating clearly the units of your answer.

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16. A prism has a uniform cross-section of  $405.7 \text{ cm}^2$  along its length of  $17.5 \text{ cm}$  and is made from material that has a density of  $5.42 \text{ g/cm}^3$ . Calculate the mass, in kg, of the prism.

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17. A solution to the equation

$$x^3 - 12x - 25 = 0$$

lies between 4.2 and 4.3.

Use the method of trial and improvement to find this solution correct to 2 decimal places.

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18. In a sale, the original price of a television is reduced by 38%. The sale price is £899. Calculate the original price of the television.

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19. Solve the following simultaneous equations by an algebraic (not graphical) method. Show all your working.

$$\begin{aligned}5x - 2y &= -2 \\7x - 3y &= -4\end{aligned}$$

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[4]

20. (a) Write **each** of the following numbers in standard form.

(i) 8 370 000 000

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(ii) 0.00059

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[2]

- (b) Find, in standard form, the value of

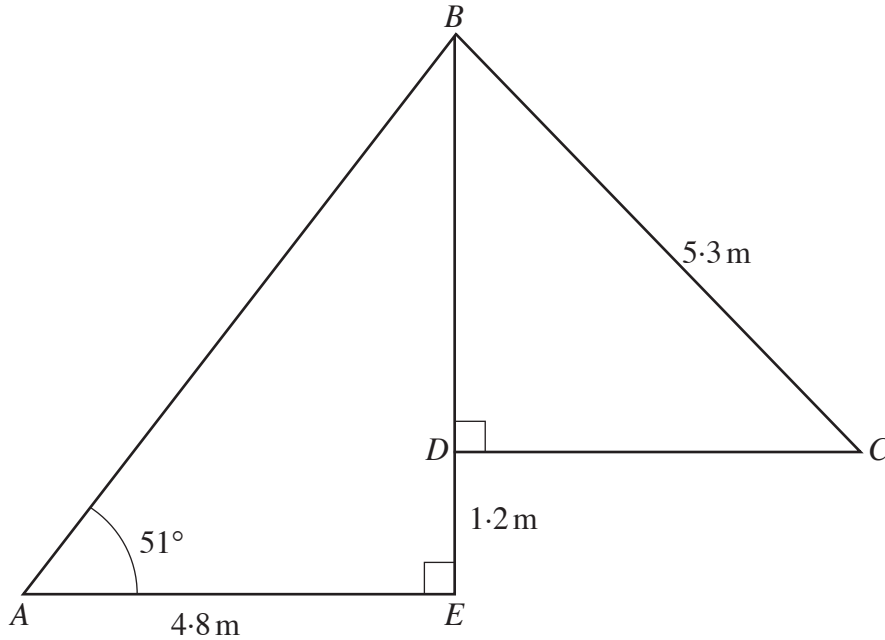
$$(4.7 \times 10^{-5}) \div (8.3 \times 10^{-8}).$$

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[2]

21. In the diagram below,  $ABE$  is a triangle in which  $AE = 4.8$  m,  $\hat{BEA} = 90^\circ$  and  $\hat{BAE} = 51^\circ$ . The point  $D$  is on  $BE$  such that  $ED = 1.2$  m. The triangle  $BDC$  is right-angled at  $D$  and  $BC = 5.3$  m.



*Diagram not drawn to scale.*

- (a) Find the length of  $BE$ .

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- (b) Calculate the size of  $\hat{BCD}$ .

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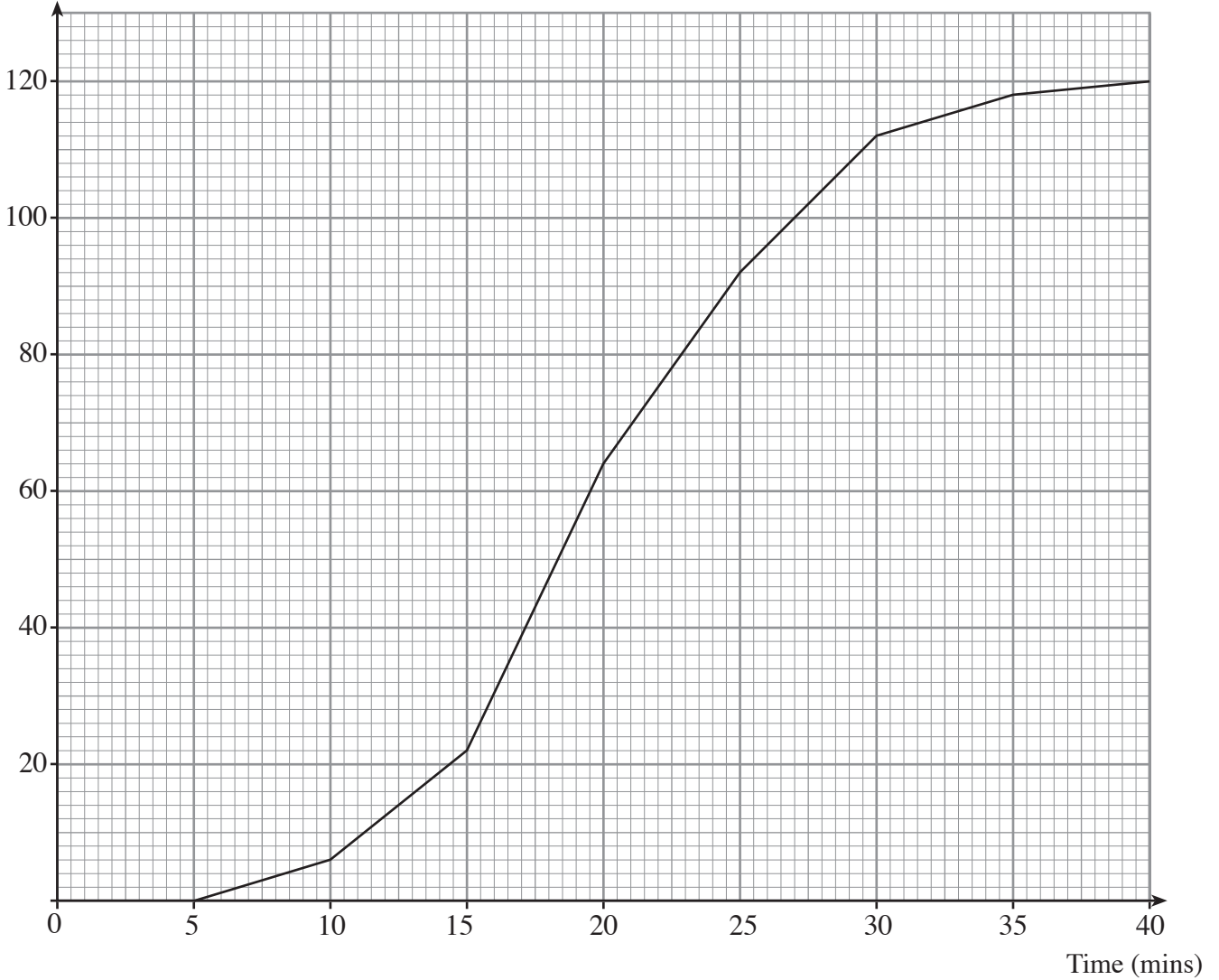
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22. The times (in minutes) taken by 120 pupils to travel to school were measured. Below is a cumulative frequency polygon of the results.

Cumulative  
frequency



Use the cumulative frequency polygon to find an estimate for

(a) the inter-quartile range,

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[2]

(b) the number of pupils that travelled for longer than 28 minutes to get to school.

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[2]

23. On the graph paper below, draw the region which satisfies all of the following inequalities.

$$\begin{aligned}x &\leq 3 \\y &\geq -1 \\ \text{and } y &\leq 3x - 2\end{aligned}$$

**Make sure that you clearly indicate the region that represents your answer.**

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[4]

